

# JAVANESE ANGKLUNG IN THE AUCKLAND INSTITUTE AND MUSEUM

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*Abstract.* Three specimens of the musical instrument, *angklung*, from Java, gifted to the Museum by Capt. G.A. Humphreys-Davies in 1930, are examined with reference to the organology of the *angklung*, its historical and social context, and to its pitch and tonality. Pitch measurements and tonal sequence in relation to traditional Javanese tone sequences are tabled. Note is made of the present-day use in Indonesia of a Westernized form of the *angklung*.

The bamboo rattle-chime, *angklung*, as represented by three specimens in the Auckland Museum, is a folk instrument of ancient origin.

The classical Javanese orchestra (*gamelan*) includes a variety of wood and metal chime-idiophones, but the *angklung* is traditionally associated with ensembles used in village rites and festivities rather than with more sophisticated court orchestras. Although there is evidence of its dispersal throughout Java, as well as in the islands of Madura, Bali, Sumatra and Borneo, the instrument is primarily associated with West Java, in particular with the Sundanese mountain districts, where its highest concentration is found (Kunst 1973, 1:361). That a comparatively recent work based on five years' study of *gamelan* instruments in Central Java (Lindsay 1979) makes no mention of the *angklung* serves to confirm its inherent status as a folk artefact.

The three *angklung* in the Auckland Museum (Fig.1) were gifted in 1930 by Captain G.A. Humphreys-Davies who later was Honorary Curator of the Oriental Collections in the Museum. The Auckland Museum accession book records (Acc.No. 133/30 of 14.IV.30) "Three musical instruments called Anklong [sic.], used by the Sundanese of Central Java". These instruments are typical two-tubed bamboo *angklung* with measurements as given in Table 1.

## *Organological aspects*

The specimens in the Auckland Museum accord with most general descriptions of the instrument as constructed of two or three bamboo tubes of graduated lengths, tuned in octaves, and suspended vertically in a rectangular bamboo frame. The upper portion of each tube is cut to form a tongue, the lower end is closed and has two short extending strips which fit loosely into individual slots cut into the transverse tubular base (Fig.1). When the frame is shaken, the tubes slide back and forth in their slots sounding their characteristic notes by striking the rim of their grooves (Grove 1980, 1:427, 9:208; Kunst 1973, 1:361; Jenkins 1970:34; Wellesz 1957, 1: 167).

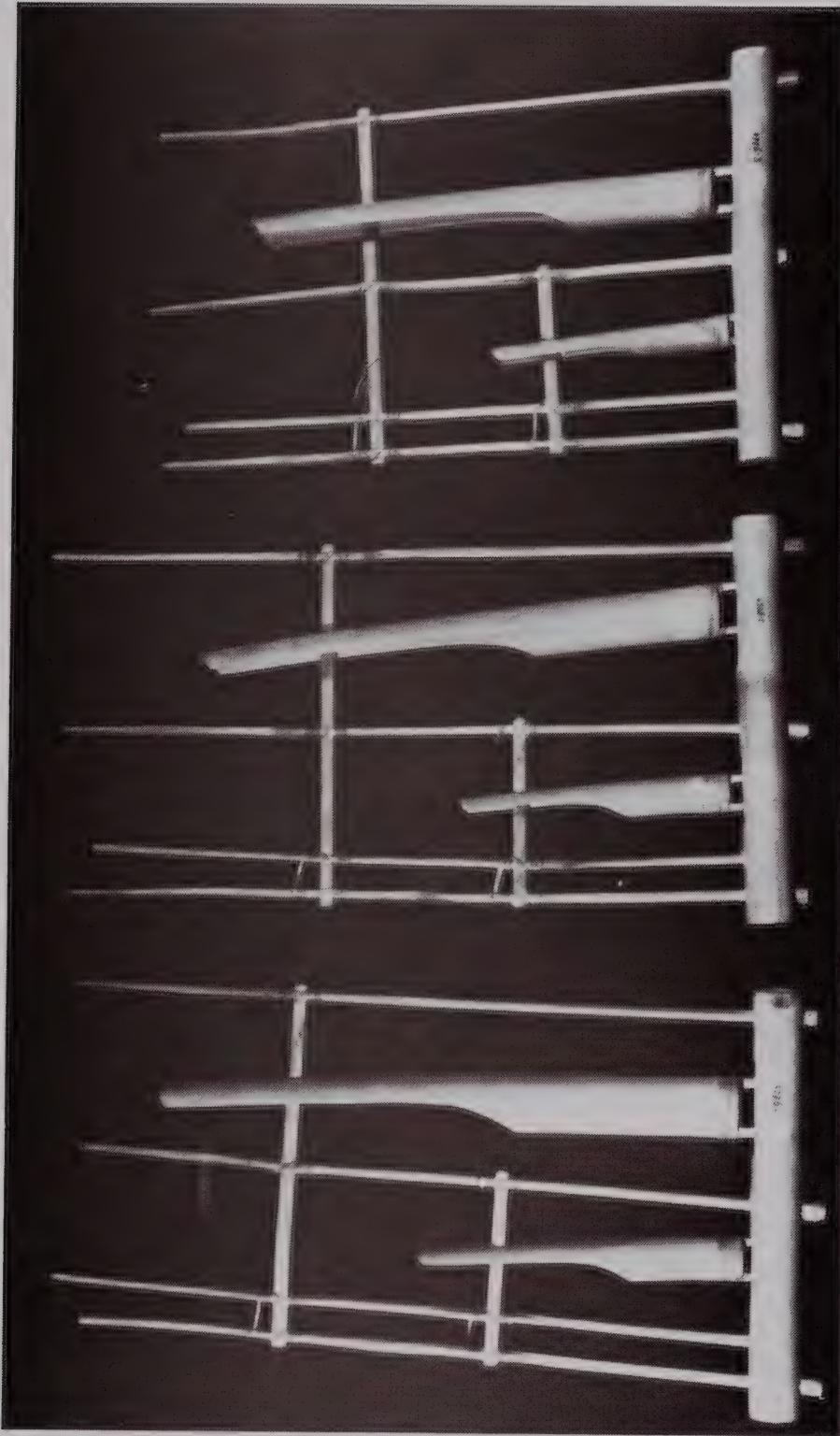


Fig. 1. *Angklung* in the Auckland Institute and Museum (Nos. 4796.1-3). Left. 4796.2. Middle. 4796.1. Right. 4796.3.

Table 1. Measurements of *angklung* in the Auckland Museum (Nos. 4796.1-3).

<i>Angklung</i> *	4796.2 cm	4796.1 cm	4796.3 cm
Outside frame rods	54.0	54.5 54.0	47.0
Horizontal base	29.5	29.0	29.0
Large tube, full length	44.0	39.5	36.0
from lowest cut edge	18.0	15.5	13.0
inside diameter	3.0	2.8	2.5
Small tube, full length	25.0	21.5	19.0
from lowest cut edge	10.0	9.5	8.5
inside diameter	2.0	1.8	1.5

\* Measurements of the 3 instruments are given in the same order as they appear in Fig.1.

Kunst (1973,1:361) states that the air column in the tubular part of the mobile bamboo segments of the *angklung* produces, when blown, the same tone pitch as the entire segment (tubular part plus tongue) when beaten or shaken. The distinctive shape of the *angklung* tubes (Fig.1) is the result of cutting to form a tongue and resonator balanced in pitch as stated. To ascertain pitch of the tubular part or resonator the tube is blown into; and, although the *angklung* is essentially an idiophonic instrument, the passage of air in the tubular column is also associated in popular Javanese belief with the instrument's origins. In earlier times, Raffles (1817, 1: 472) wrote, "The Javans say the first music of which they have an idea was produced by the accidental admission of the air into a *bámbu* tube, which was left hanging on a tree, and that the *ángklung* was the first improvement upon this Eolian music."

An ancient Javanese agricultural method also suggests a constructional analogy with the *angklung*. Carefully-cut bamboo tubes were arranged on pivots so that when filled with water from irrigation channels above they toppled over, and upon regaining an upright position hit a stone, causing a ringing tone to be emitted at regular intervals. From this it evolved that whole series of tubes were often erected superfluously with deliberate attention to pitch and timing (Kunst 1973, 1:196). The affinity of this bamboo water clatterer or *taluktak* with chime-idiophones such as the *angklung* is readily apparent.

Standard references generally describe the *angklung* as two- or three-tubed. The outside frame rods of the two larger two-tubed instruments in Auckland measure 54-54.5 cm (Table 1) compared with the measurement of 81 cm given for a two-tubed instrument in the Horniman Museum, London (Jenkins 1970, pl.4, No.29). A four-tubed instrument is mentioned by McPhee (1966: 32,235) as found in Bali. There is evidence also of an early form in the Sundanese district of West Java having "five or more tubes... cut at the end after the manner of the barrels of an organ" (Raffles 1817, 1:472). The description is illustrated in an engraving showing, among such household implements as a loom and spinning wheel, an *angklung* of five tubes (ibid., pl.opp.168). The estimated length of the tubes as ranging from "about twenty to eight inches [50.8-20.3 cm]" (ibid:472) is compatible with full length tube-measurements of the Auckland instruments, which range from 44.0 to 19.0 cm (Table 1).

Photographs of later Javanese *angklung* show the usual instruments with only two or three tubes, but often suggest a larger, more primitive, format (Kunst 1973, 2: 440, Ill. 121; 444, Ill. 136; 448, Ill. 151; Winitasmita & Budiaman 1978: 12, Ill. 1) than that of the instruments under discussion. They are held by seated, standing, or walking players and sometimes have their frame-tips decorated with ribbons or feathers. In one instance *angklung* reach from almost ground level to the full height, and higher, of the walking musicians (Winitasmita & Budiaman 1978: 13, Ill. 2).

Traditional Javanese *angklung* are usually combined in sets of nine or fourteen instruments of graduated size and pitch, and are played either held in the hand, in which case a single player can handle only two instruments at most, or suspended in scale sequence onto a long bamboo yoke (*kakancho*), when two or three players will suffice (Kunst 1973, 1: 362, 2: 448, Ill. 150). Sources vary as to the number of instruments per set: Grove (1980, 9: 209), "four or more", Jenkins (1970: 34), "seven or eight". That the *angklung* is traditionally employed in this way, however, accounts both for disparities in size of isolated specimens, and for the overall gradation in tube-lengths from small to large of the three Auckland instruments, which may be part of an original larger set.

In Java, according to McPhee (1966), the *angklung* is usually shaken back and forth in performance, the tubes knocking against both ends of their slots to produce a tremolo tone, as distinct from the Balinese method of using a series of single, or quickly repeated double shakes. The hollow, almost metallic sound produced is not unmusical and generally has a strong appeal to the Western ear.

The quality of bamboo used, its thickness and diameter, and even the season in which it is cut (Winitasmita & Budiaman 1978: 68) are important considerations in the manufacture of the *angklung*. Some idea of the exacting process of cutting, paring, and testing also involved is given by McPhee (1966: 235, footnote<sup>1</sup>) from observation in Bali.

A *pandé krawang* from the Karangasem village of Tiyingan made me a set of *angklungs* by the following method. Each tube was cut to its approximate length, after which the tongue was cut. The tube itself was then tuned by cutting down, the *pandé* blowing into it from time to time and listening to ascertain the pitch. As a model for tuning, a *gangsá* [metal keyed instrument] from the ensemble for which the *angklungs* were intended was used. When the right pitch had been reached, the tongue was then cut down until, when tapped against the cement floor of my house, it gave the same tone as when the tube itself was blown into. The *pandé* explained "The tongue is the key (*don*) and the tube its resonator (*bum-bung*). Key and tube must correspond in tone as in other instruments."

It should be noted that the normal folk *angklung* of Java, like those in the Auckland Museum, is an octave *angklung* sounding one tone amplified at the octave. A rarer type occurring in Central Java and Borneo, although similar in appearance to the octave *angklung* is often made of a spotted bamboo, and its invariably three tubes are tuned not in octaves but in three different tones to form a chord (Kunst 1973, 1: 363).

*Historical and social context*

McPhee (1947: 101) remarks that the *angklung* was used in Indonesia “long before the coming of the Hindus”. The Hindu immigrations which began in Java about the first century A.D. inaugurated a period of Indian influence which extended into the sixteenth century. Writing of the older stock of natives known as *kalang* (wild devils) and called by the first Hindu invaders *rásaka*, Campbell (1915, 1:8, 10-12) gives an account of primitive Javanese harvesting rites which incorporated the *angklung*.

When the crop of wild millet was gathered, the elder decided when and where the horde should next move. Before departing they feasted and offered sacrifices in an open plain, attracting to the remains of their repast the bird called *úlung gága*, and the young men would shake a rude musical instrument ... called the *ángklung*, shouting and dancing to its accompaniment in a wild, ludicrous and aimless fashion, and becoming at last mad with its sounds ... In case of favourable omen [dependent on the antics of the bird] another feast was partaken of, which ended in violent exhibitions or demonstrations of joy, in which the *ángklung* played a prominent part. When all was ready for the journey, the oldest man of the horde with his wife and children either was placed upon an elephant or was carried in a rough litter, and began to move in the direction he had indicated; the rest moved on foot behind him. Preceding the horde were the young men and boys shaking the *ángklung* and shouting aloud, for the two-fold purpose of rendering the necessary homage to their chief and of frightening away the wild beasts which abounded all over the island in countless multitudes at that period.

Sir Stamford Raffles, Lieutenant Governor of Java from 1811 to 1816, recorded (T.S. Raffles 1817, 1:472) that a troop of from ten to fifty mountaineers, each with an *angklung*, and accompanied by one or two others with a small drum played with the open hand, always performed on occasions of festivity in the Sundanese districts. The upper parts of the instruments were generally decorated with common feathers, as were the performers themselves, who were described as “grotesque and wild”. Raffles was so charmed, nonetheless, by the sound produced by the rattling of the bamboo tubes that he confessed to never having heard the *angklung* without pleasure. An ancient use of the *angklung* all over West Java as part of an ensemble accompanying masked dances (*topèng*) is also reported by Kunst (1973, 1:379).

Twentieth-century reports of the instrument include its use in the following ways:

- (1) In an ensemble of four single-headed drums and several *angklung* to accompany rice harvesting activities in West Java. The dancing musicians accompany the rice carriers to the village and perform the ancient *dogdog lojor* dance (Grove 1980, 9: 212).
- (2) In the *badut* folk orchestra of West Java consisting of nine *angklung*, one to four *dogdog* [single-headed drums], and a *tarompèt* [an oboe-like wind instrument], whose players perform burlesque dances while playing (Kunst 1973, 1:378, 2: 448, III. 149).
- (3) In the *bunchis* folk orchestra of West Java, whose players also perform simple dances, generally moving around in a circle (*ibid*, 1:379).
- (4) In the *ogèl* folk orchestra of West Java, which provides accompaniment to the performance of buffoons (*ibid*).

- (5) In ranges of five or seven *angklung* suspended on a yoke, replacing traditional instruments in both West and East Javanese *gamelan* (ibid: 363).
- (6) Among the South Banten Badui people of West Java on the occasion of the *kawalu* feast, as a signal at the close of work on sacred arable land (ibid).
- (7) As a signalling instrument for guardsmen in a *kampung* (village), West Java (ibid).
- (8) For bridal music in an ensemble of three *angklung*, Central Java (ibid: 364).
- (9) As an accompaniment with other instruments to a peculiar form of dancing-play called *strandul* in South Surakarta, Central Java (ibid: 287).
- (10) In a *reyog* (folk drama) *gamelan* in Ponorogo, East Java (Grove 1980, 9:204).
- (11) In a *gamelan angklung*, for cremation rites and temple anniversaries in the Karangasem district of East Bali (McPhee 1947:111).

### *Pitch and tonality*

When the *angklung* is shaken, the note emitted by its largest tube is sounded an octave above by the tube next in size, and at an octave higher again by the smallest tube if there are three tubes. It is thus basically a single-tone instrument. In performance, players often build up between them melodic figurations as a background to a main melody (Kunst 1973, 1:362); hence the employment of sets of *angklung* with individual instruments variously pitched to conform with a particular tone sequence.

Owing to the extremely rapid decay in sound produced by the impact of wood against wood, (bamboo against bamboo), it was necessary in the case of the present instruments to employ an electronically-tuned instrument as an intermediary measuring device to record, on an oscillator, pitch measurement by vibration frequency. Table 2 gives the results with nearest frequencies for notes of the European scale in parentheses. For field measurement of folk instruments Roberts (1931:128) suggests a pitch-pipe which will give  $a = 435$  vibrations. Measurements below are based on the present-day standard pitch measurement,  $440 = a^1$ . Tone pitch as presently sounded is used in this study as a working basis but it should be borne in mind that some deviation from original tuning may have resulted from atmospheric changes and the instruments' long period of disuse. In Tables 2-4,  $c^1$  and subsequent letters numbered <sup>1</sup> represent the ascending octave beginning on middle C of the pianoforte keyboard,  $c^2$  begins the new octave.

Table 2. Pitch measurements of *angklung* in the Auckland Museum.

	Large tube	Small tube
4796.2	261.71 (261.6 = $c^1$ )	523.31 (523.2 = $c^2$ )
4796.1	310.5 (311.1 = $d\#^1$ )	621.68 (622.2 = $d\#^2$ )
4796.3	415.45 (415.3 = $g\#^1$ )	830.75 (830.6 = $g\#^2$ )

On the assumption that the three instruments in the Auckland Museum are component parts of one set (and their uniformity of construction supports this), the above results were then considered in the light of previously documented Javanese scales. Although the tone sequence of an *angklung* set may extend over more than two octaves, it is essentially pentatonic (Kunst 1973, 1:362). Three tone measurements out of a possible five were therefore available in the present instance. The measurements showed little conformity with the scale of an *angklung* set from Tasikmalaya, West Java (ibid). Two other comparisons, however, were feasible. Table 3 matches the results with a *pelog* scale of seven tones from which, for practical purposes, a selection of five tones may be made. The ratio of frequency numbers has been converted into cents according to the system devised by A.J. Ellis (1884), making possible interval-measurement within the framework of the European tempered scale (100 cents = 1 semitone). Nearest equivalent notes of the European scale are given below frequency numbers. It will be seen that where comparison is possible differences in terms of vibration frequencies and cent-intervals are only slight.

Table 3. Comparison of a West Javanese *gamelan pelog* scale (Kunst 1973, 2: 573, app. 61,30) with sound measurements obtained from *angklung* in the Auckland Museum.

	I	II	III	IV	V	VI	VII	I
<i>Pélog</i> Scale								
Vib.Freq.	262.5 c <sup>1</sup>	283.5 c# <sup>1</sup>	312 d# <sup>1</sup>	368 f# <sup>1</sup>	391 g <sup>1</sup>	414 g# <sup>1</sup>	458 a# <sup>1</sup>	525 c <sup>2</sup>
Cent-intervals		133	166	286	105	99	175	236
		299		488				
		778						
Auckland Museum <i>angklung</i>								
Vib.Freq.	261.71 c <sup>1</sup>		310.5 d# <sup>1</sup>			415.45 g# <sup>1</sup>		
Cent-intervals		296		502				
		789						

Table 4 utilises a scale of another popular Sundanese instrument, the zither-like *kachapi*. A characteristic feature of this once frequently-heard scale is its close approximation to Western diatonic tonality (Kunst 1973, 1:358), hence its transcription by Kunst in Western staff notation (ibid: 396). Its transcription here in European letter notation and descending Javanese form is matched with the nearest equivalent notes of the Auckland measurements as indicated in Table 2, correspondingly flattened. Although necessarily incomplete, the matchings in Tables 3 and 4 illustrate the possibility of the selected scales, or of similar tone sequences, being used for an *angklung* set.

Table 4. Comparison of a Sundanese *mèlog kachapi* scale (Kunst 1973, 1:396) with sound measurements obtained from *angklung* in the Auckland Museum.

<i>Mèlog</i> scale	c <sup>2</sup>	a <sub>b</sub> <sup>1</sup>	g	e <sub>b</sub> <sup>1</sup>	d <sub>b</sub> <sup>1</sup>	c <sup>1</sup>
Auckland Museum <i>angklung</i>		a <sub>b</sub> <sup>1</sup>		e <sub>b</sub> <sup>1</sup>		c <sup>1</sup>

### *Sponsorship of the angklung by the Indonesian government*

The foregoing survey has dealt with the *angklung* in an historical and traditional context. Although the instruments in the Auckland Museum seem modest in format compared with some of the more primitive types, their acquisition by the Museum as early as 1930 suggests a rightful categorization within this traditional framework. It should be noted, however, that today “diatonic” *angklung* (*angklung* sets built and tuned in accordance with the Western scalic system) are authorized by the Indonesian government for use in schools, public clubs, and art groups. This development was initiated in the Kuningan Regency of West Java by a Western-educated high school teacher, Daeng Soetigna. After his aim of manufacturing a set of diatonic *angklung* was realised in 1938, the new musical instrument was introduced into local “boy scout” groups, thereafter quickly becoming a popular and integral part of the scout movement in West Java (Winitasmita & Budiaman 1978: 13-14). Subsequently, decrees such as those by the Presidential Cabinet in 1966 (No.75), by the President of the Republic of Indonesia in 1966 and 1968 (Nos. 173 & 183), and by the Ministry of Education and Culture of the Republic of Indonesia (Keputusan Menteri Pendidikan Dan Kebudayaan Republik Indonesia, No. 082) in 1968 (ibid: 5), have firmly established the diatonic *angklung* as an instrument for use in musical education on an official and national basis. An outcome of this revivalist movement on behalf of one of Indonesia’s most ancient musical instruments is the handbook *Angklung Petunjuk Praktis* [A Practical Guide to the *Angklung*] (Winitasmita & Budiaman 1978), which gives full details of the background, specifications, playing, teaching, and care of the diatonic *angklung*.

### *Discussion*

From Tables 2-4 it has been seen that the pitch- and interval-measurements of the Auckland Museum *angklung* partially conform with certain Javanese tone sequences. The possibility remains, however, that the three instruments are a self-contained set of three tones only. It is apparent also that they comprise a tonal framework which accords with Western diatonic tonality. In *Music in Java*, first published in 1933, Kunst writes of the acceptability of much Sundanese music to Western ears (1973, 1:358), a feature already illustrated in the *kachapi* scale of Table 4. Other scales are referred to as having become progressively more Westernized under the influence of European music and musical instruments (ibid: 394). In 1933, an official project was, in fact, launched in schools to raise native Sundanese vocal music



from the decline brought about by this influence (ibid, footnote 3). As much of Kunst's original research was carried out in the 1920s it seems clear that the traditional music of the Sundanese mountain districts where the *angklung* is most common was under Western influence well prior to the Museum's 1930 accession-date for the instruments. The possibility is thus presented of Western-influenced *angklung* sets circulating in Java before the official introduction of the diatonic *angklung* in 1938, and of the Auckland instruments being part of such a set. That in appearance they more nearly resemble diatonic *angklung* held by West Javanese school children (Grove 1980,9: 209, Fig.24) than most depictions of the original folk instrument gives some feasibility to speculation in this direction. The three specimens have been accepted here, nonetheless, as traditional instruments and seen to conform generally with documented evidence of the traditional Javanese *angklung*.

*Acknowledgements.* Acknowledgement is made to the Museum Director, Mr. S. Park; to the Museum Ethnologist, Mr. D. Simmons, for advice and generous access to the instruments; and to members of the Ethnology Department for assistance. Thanks are due also to Mr. G. Maitland of the Museum Library for arranging photography and to the photographer Mr. P. Brennan. For technical expertise regarding sound measurements I am indebted to Mr. S. Beech. My thanks also to Mrs. R. Achmad, Department of Asian Languages and Literatures, University of Auckland, for her translation of *Angklung Petunjuk Praktis*, and to Miss B. Anscombe, Music Department Librarian at the University of Auckland, for supplying relevant literature.

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